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Attorney's Docket No. 1017750-000732

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of Vernon T. Brady et al.	Group Art Unit: 2615
Application No.: 09/975,995	Examiner: Briney III, Walter F
Filed: October 15, 2001	Appeal No.: _____
For: METHOD AND APPARATUS FOR HIGH FREQUENCY WIRELESS COMMUNICATION	

APPEAL BRIEF

Mail Stop APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This appeal is from the decision of the Primary Examiner dated January 11, 2008 finally rejecting claims 1, 2, 11, 12, 19, 25, 26, 29, 36, 37, 40, 76-83, 86-94 and 97-102, which are reproduced as the Claims Appendix of this brief.

☐ A check covering the ☐ $ 255 ☐ $ 510 Government fee is filed herewith.

☒ Charge ☐ $ 255 ☒ $ 510 to Deposit Account No. 02-4800.

The Commissioner is hereby authorized to charge any appropriate fees under 37 C.F.R. §§1.16, 1.17, and 1.21 that may be required by this paper, and to credit any overpayment, to Deposit Account No. 02-4800.

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I. Real Party in Interest

The present application is assigned to Lockheed Martin Corporation. Lockheed Martin Corporation is the real party in interest, and is the assignee of Application No. 09/975,995.

II. Related Appeals and Interferences

On September 24, 2007, a Notice of Panel Decision from Pre-Appeal Brief Review was issued in which the panel determined that the claims remain rejected, and indicated to the Appellants to proceed to Board of Patent Appeals and Interferences. Subsequently, Appellants filed a Request for Continued Examination along with a Response on October 24, 2007, which filing did reduce the number of issues for the purpose of the present Appeal.

A subsequent final Office Action having been issued on January 11, 2008, this appeal is from the decision of the Primary Examiner, dated January 11, 2008, finally rejecting claims 1, 2, 11, 12, 19, 25, 26, 29, 36, 37, 40, 76-83, 86-94 and 97-102, which are reproduced as the Claims Appendix of this brief.

The Appellant legal representative, or assignee, does not know of any other appeal or interferences which will affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

III. Status of Claims

Claims 1, 2, 11, 12, 19, 25, 26, 29, 36, 37, 40, 76-83, 86-94 and 97-102 are currently pending, and are rejected. Claims 3-10, 13-18, 20-24, 27, 28, 30-35, 38, 39 and 41-75 were withdrawn from consideration by the November 2, 2005 Office Action, and were subsequently canceled by the Appellants' Amendment of September 11, 2006. By the Appellants' Amendment of March 12, 2007, claims 84, 85, 95, 96, 103 and 104 were also canceled.

IV. Status of Amendments

No amendments were filed after the final rejection dated January 11, 2008.

V. Summary Claimed Subject Matter

As Appellants have disclosed of record, a power output means 106 supplies an output to a first 90° hybrid 134, such 90° hybrids being arranged in tandem to permit the use of a plurality of separate, parallel stages, or channels, of amplification (e.g., page 8, lines 7 and 8; Fig. 1). Appellants have further disclosed that outputs of a voltage regulator chip 212 include a drive output 222 and an additional output of the voltage regulator (page 10, lines 12-15); and that if the voltage at node 248 rises above a predetermined threshold, current will not flow from the voltage input 202 to the node 248 (page 11, lines 18-20).

As recited in claim 1, an apparatus is disclosed for full duplex wireless communication of information (e.g., page 3, lines 5 and 6). The apparatus comprises means for performing at least one of modulating and demodulating information signals (e.g., page 3, line 7; Figs. 1 and 3), the modulated information signal being boosted in power using a plurality of 90° hybrids arranged in tandem to output a plurality of amplification channels (e.g., page 7, lines 15-25; Fig. 1); means for information transmission/reception, said information transmission/reception means providing for information transmission using a first polarization and for information reception using a second polarization to thereby isolate information transmission from information reception in full duplex communication (e.g., page 3, lines 8-11; Fig. 5A); regulator means having at least one DC voltage regulator for providing at least two DC output voltages (e.g., page 10, lines 12-14; Fig. 2); and

means for inhibiting a first of said two DC voltage outputs when a second of said two DC voltage outputs is above a predetermined threshold (e.g., page 11, lines 18-23).

As recited in claim 19, a method is disclosed for full duplex wireless communication of information (e.g., page 3, lines 5-6). The method comprises the steps of performing at least one of modulating and demodulating information signals (e.g., page 3, line 7; Figs. 1 and 3), the modulated information signal being boosted in power using a plurality of 90° hybrids arranged in tandem to output a plurality of amplification channels (e.g., page 7, lines 15-25; Fig. 1); isolating transmission/reception of information by transmitting information with a first polarization and by receiving information with a second polarization in full duplex communication (e.g., page 3, lines 8-11; Fig. 5A); providing a regulated DC output voltage and a second regulated DC output voltage (e.g., page 10, lines 12-14; Fig. 2); and inhibiting an output of said regulated DC output voltage when said second regulated DC output voltage is above a predetermined threshold (e.g., page 11, lines 18-23).

As recited in claim 29, a transceiver is disclosed for full duplex wireless communication of information (e.g., page 2, line 30). The transceiver comprises at least one of a modulator for modulating information and a demodulator for demodulating information (e.g., page 3, lines 1 and 2; Figs. 1 and 3), the modulated information being boosted in power using a plurality of 90° hybrids arranged in tandem to output a plurality of amplification channels (e.g., page 7, lines 15-25; Fig. 1); a dual polarization antenna for transmitting said information with a first polarization, and for receiving information with a second polarization opposite to said first polarization in full duplex communication (e.g., page 3, line 3 and 4; Fig. 5A); at

least one DC voltage regulator producing at least two DC voltage outputs (e.g., page 10, lines 12-14; Fig. 2); and a switch for inhibiting a first of said two DC output voltages when a second of said two DC voltage outputs is above a predetermined threshold (e.g., page 11, lines 18-23).

VI. Grounds of Rejection to be Reviewed on Appeal

The final Office Action presents the following grounds of rejection to be reviewed on this appeal.

1) The rejection of claims 1, 2, 11, 12, 19, 25, 26, 29, 36, 37, 40, 76-83, 86-88, 90-94 and 97-102 under 35 U.S.C. 103(a) as being unpatentable over US Patent 5,619,503 to Dent ("Dent") in view of US Patent 5,793,253 to Kumar et al. ("Kumar et al.") and further in view of US Patent 4,459,651 to Fenter ("Fenter").

2) The rejection of claim 89 under 35 U.S.C. 103(a) as being unpatentable over the Dent patent in view of the Kumar et al. patent in view of the Fenter patent and further in view of US Patent 5,911,117 to Bhame et al. ("Bhame et al.).

VII. Argument

Independent claims 1, 19 and 29 are allowable over U.S. Patent 5,619,503 (Dent et al.); US Patent 5,793,253 (Kumar et al.); and U.S. Patent 4,459,651 (Fenter). These documents, when considered individually or in the combinations as suggested by the Examiner, do not teach or suggest Appellants' below recited claim features. Independent claims 1, 19 and 29 are therefore allowable.

I. The Examiner Has Failed To Establish A Prima Facie Case of Obviousness In Combining The Dent, Kumar et al., And Fenter Patents To Reject Independent Claims 1, 19 And 29

In numbered paragraph 1, pages 2 and 3 of the January 11, 2008 final Office Action, the Examiner rejects claims 1, 2, 11, 12, 19, 25, 26, 29, 36, 37, 40, 76-83, 86-88, 90-94 and 97-102 under 35 U.S.C. 103(a) as being unpatentable over the Dent patent in view of the Kumar et al. patent and further in view of the Fenter patent. This rejection is respectfully traversed.

On page 4 of the January 11, 2008 final Office Action, while the Examiner "concedes that information transmitted using the first polarization and information received using the first polarization are not isolated via orthogonal polarizations," the Examiner appears to conclude on the same page that "the information transmitted with the first polarization is isolated from the information received with the second polarization." Appellants respectfully disagree with the Examiner's ultimate conclusion.

The Dent patent would not have taught or suggested information transmission/reception means providing for information transmission using a first polarization and for information reception using a second polarization to thereby isolate information transmission from information reception in full duplex communication, as recited in claim 1. Claims 19 and 29 recite similar functional features. Rather, the Dent patent relates to using dual polarization to increase the number of signals they can send in the bandwidth they have. The Dent patent discloses transmitting two signals each having different polarizations so they can transmit twice the signals at the same frequency. This is polarization for transmission of two signals, and does not relate to the receiving of signals.

In contrast, Appellants have disclosed transmitting one signal with one polarization and receiving a receive signal with a different polarization. As Appellants have claimed, the isolation provided by the polarization affords separation of the transmit signal from the receive signal of the co-located receiver. The Dent patent would not have taught or suggested information transmission/reception means providing for information transmission using a first polarization and for information reception using a second polarization to thereby isolate information transmission from information reception in full duplex communication, as recited in claim 1. Claim 19 similarly recites, isolating transmission/reception of information by transmitting information with a first polarization and by receiving information with a second polarization in full duplex communication. Claim 29 similarly recites a dual polarization antenna for transmitting said information with a first polarization, and for receiving information with a second polarization opposite to said first polarization in full duplex communication.

Further, the Dent patent discloses a frequency multiplexer to combine at transmission, and split the two signals apart when received, the two signals being at different frequencies. In contrast, Appellants' claimed features result in a lot less bandwidth and the device for combining the two polarizations, e.g., an ortho-mode transducer is comparatively very wide in bandwidth an inexpensive.

Further, the Examiner does not seem to address the hybrid arrangement for polarized transmission as Appellants have claimed. At least for these reasons, the Dent patent would not have taught or suggested modulated information signal being boosted in power using a plurality of 90° hybrids arranged in tandem to output a plurality of amplification channels; and means for information transmission/reception, said information transmission/reception means providing for information transmission using a first polarization and for information reception using a second polarization to thereby isolate information transmission from information reception in full duplex communication, as recited in claim 1, and which functional features are similarly recited in claims 19 and 29.

Further, the Dent patent and the Fenter patent, when considered individually or in the combination as suggested by the Examiner, would not have taught or suggested regulator means having at least one DC voltage regulator for providing at least two DC output voltages; and means for inhibiting a first of said two DC voltage outputs when a second of said two DC voltage outputs is above a predetermined threshold, as recited in claim 1, and which functional features are similarly recited in claims 19 and 29.

The January 11, 2008 final Office Action refers to the previous final Office Action dated May 30, 2007. On page 5 of the May 30, 2007 final Office Action, the Examiner admits "Dent does not disclose regulating power, or for that matter any manner concerning power consumption."

The Fenter patent does not cure the deficiencies of the Dent patent. The cited passage in the Fenter patent does not speak of Appellants' claimed "at least one DC voltage regulator for providing at least two DC output voltages," and is completely silent as to "inhibiting a first of said two DC voltage outputs when a second of said two DC voltage outputs is above a predetermined threshold." Rather the relevant passage in the Fenter patent (col. 2, line 1-16) merely appears to

disclose that "It is a further object of this invention to provide a switching regulator power supply which minimizes power consumption and maximizes energy transfer notwithstanding changes in input line voltage."

The Fenter patent teaches an apparatus for converting AC voltages to DC voltages, particularly for switching regulator power supplies (col. 1, lines 8-12). The apparatus uses a triggered switching technique, based on voltages exceeding a threshold level, to vary the width of a pulse that is proportional to the AC line voltage, so that variations in the AC input to the regulator are compensated for with energy either provided to or gotten from a storage capacitor. This provides a "steady" source of power to a constant load, reducing output voltage variations due to variations in the AC input. The regulator also senses the changes in the output load and uses a frequency converter to alter the rate at which the variable width pulses are generated. This allows minimizing the power delivered to the transformer' secondary, which also minimized the power consumption of the power supply. The disclosure in the Fenter patent relies on the detection of variations in the AC as well as load variations. However, the Fenter patent does not relate to, and would not have taught or suggested at least one DC voltage regulator for providing at least two DC output voltages, as variously recited in claims 1, 19 and 29.

The Fenter disclosure relates to detecting the difference in AC voltages to provide the variable pulse widths needed to control the output voltages. In contrast, Appellants' regulator has a DC input, which is distinct from the Fenter disclosure of AC voltages. Fenter disclosure, even if applied to Appellants' full-duplex wireless communication, the levels of regulation provided by the Fenter patent is inadequate for the communication of information as encompassed by Appellants' claims 1, 19 and 29.

Further, the Fenter disclosure of circuit does not allow the output of the +5 V to go very far above +5 V. It does this by interrupting the pulses to the primary windings. In contrast, Appellants have claimed inhibiting a first of two DC voltage outputs when a second of two DC voltage outputs is above a predetermined threshold. The Fenter disclosure does not relate to this claimed feature. The Fenter disclosure does not teach inhibiting the voltages supplied to its circuits from exceeding critical values, while in operation.

Appellants' disclosure clearly support the claimed features. The linear circuits Appellants disclosed for DC power conditioning circuits, such as the high current regulator 200, as exemplified in Fig. 2, do provide for both lower and upper limits of voltage. The power dissipated in the regulation circuit is minimized by the use of the control transistor Q2, Fig. 2. In addition to controlling the voltage to a high degree, the monolithic circuits in Appellants' disclosed apparatus are protected from damaging high currents by ensuring that no currents flow into the devices unless the negative gate control voltages are correct.

At least for these reasons, the Fenter patent relates to providing two regulated voltages derived from AC, but would not have taught or suggested regulator means having at least one DC voltage regulator for providing at least two DC output voltages; and means for inhibiting a first of said two DC voltage outputs when a second of said two DC voltage outputs is above a predetermined threshold, as recited in claim 1. Claims 19 and 29 recite similar features.

The Kumar et al. patent does not cure the deficiencies of the Dent patent and the Fenter patent. As referenced in the January 11, 2008 and May 30, 2007 final Office Actions, the Kumar et al. patent was applied by the Examiner in the December 14, 2006 Office Action for its disclosure of a solid state transmitter providing two stages of amplification, but the Kumar et al. patent, when considered individually or in the combination with the Dent patent and the Fenter patent as the Examiner has suggested, would not have taught or suggested information transmission/reception means providing for information transmission using a first polarization and for information reception using a second polarization to thereby isolate information transmission from information reception in full duplex communication; regulator means having at least one DC voltage regulator for providing at least two DC output voltages; and means for inhibiting a first of said two DC voltage outputs when a second of said two DC voltage outputs is above a predetermined threshold, as recited in claim 1, and as similarly recited in claims 19 and 29.

II. The Examiner Has Failed To Establish A Prima Facie Case of Obviousness In Combining The Dent, Kumar et al., Fenter and Bhame Patents To Reject Dependent Claim 89

In numbered paragraph 2, page 3 of the January 11, 2008 final Office Action, the Examiner rejects claim 89 under 35 U.S.C. 103(a) as being unpatentable over the Dent patent in view of the Kumar et al. patent and the Fenter patent and further in view of US Patent 5,911,117 to Bhame et al. ("Bhame et al.). This rejection is respectfully traversed.

As set forth above, Appellants have argued that the Fenter patent relates to providing two regulated voltages derived from AC, but would not have taught or suggested regulator means having at least one DC voltage regulator for providing at least two DC output voltages; and means for inhibiting a first of said two DC voltage outputs when a second of said two DC voltage outputs is above a predetermined threshold, as recited in claim 1. As further set forth above, the Kumar et al. patent does not cure the deficiencies of the Dent patent and the Fenter patent.

The Bhame et al. patent was applied by the Examiner in paragraph 3, page 6 of the May 30, 2007 final Office Action, which references the December 14, 2006 Office Action for its disclosure of a "cabinet 33" for RF equipment, as best gathered from the disclosure and Fig. 3, but the Bhame et al. patent, considered individually or in the combination as suggested by the Examiner, would not have taught or suggested the above recited features of claim 1, from which claim 89 depends from. At least for these reasons, the references as applied by the Examiner would not have taught or suggest the features recited in claim 89.

CONCLUSION

For the foregoing reasons, Appellants' claims 1, 19 and 29 are allowable. The remaining claims depend from the independent claims, and are also allowable.

At least for the reasons set forth, the final rejection should be reversed.

VIII. Claims Appendix

See attached Claims Appendix for a copy of the claims involved in the appeal.

IX. Evidence Appendix

(none)

X. Related Proceedings Appendix

(none)

Respectfully submitted,

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VIII. CLAIMS APPENDIX

The Appealed Claims

1. Apparatus for full duplex wireless communication of information, comprising:

means for performing at least one of modulating and demodulating information signals, the modulated information signal being boosted in power using a plurality of 90° hybrids arranged in tandem to output a plurality of amplification channels;

means for information transmission/reception, said information transmission/reception means providing for information transmission using a first polarization and for information reception using a second polarization to thereby isolate information transmission from information reception in full duplex communication;

regulator means having at least one DC voltage regulator for providing at least two DC output voltages; and

means for inhibiting a first of said two DC voltage outputs when a second of said two DC voltage outputs is above a predetermined threshold.

2. Apparatus according to claim 1, wherein said performing means further includes:

a modulating means having a data input means, a data processing means, and a power output means.

3. - 10. (Canceled)

11. Apparatus according to claim 1, wherein said information transmission/reception means includes:

a transmission antenna; and

a reception antenna separated by a distance from said transmission antenna.

12. Apparatus according to claim 1, wherein said information transmission/reception means further includes:

a single antenna having a dual polarization capability for transmitting information with a first polarization, and for receiving information with a second polarization.

13. - 18. (Canceled)

19. A method for full duplex wireless communication of information, comprising the steps of:

performing at least one of modulating and demodulating information signals, the modulated information signal being boosted in power using a plurality of 90° hybrids arranged in tandem to output a plurality of amplification channels;

isolating transmission/reception of information by transmitting information with a first polarization and by receiving information with a second polarization in full duplex communication;

providing a regulated DC output voltage and a second regulated DC output voltage; and

inhibiting an output of said regulated DC output voltage when said second regulated DC output voltage is above a predetermined threshold.

20. - 24. (Canceled)

25. A method according to claim 19, wherein said step of isolating transmission/reception of information further includes the steps of:

transmitting information signals via a transmission antenna; and

receiving information signals via a reception antenna separated by a distance from said transmission antenna.

26. A method according to claim 19, wherein said step of isolating transmission/reception of information, further includes a step of:

transmitting information via a dual polarization antenna using a first polarization, and receiving information with a second polarization via said dual polarization antenna.

27. - 28. (Canceled)

29. A transceiver for full duplex wireless communication of information, comprising:

at least one of a modulator for modulating information and a demodulator for demodulating information, the modulated information being boosted in power using a

plurality of 90° hybrids arranged in tandem to output a plurality of amplification channels;

a dual polarization antenna for transmitting said information with a first polarization, and for receiving information with a second polarization opposite to said first polarization in full duplex communication;

at least one DC voltage regulator producing at least two DC voltage outputs; and

a switch for inhibiting a first of said two DC output voltages when a second of said two DC voltage outputs is above a predetermined threshold.

30. - 35. (Canceled)

36. A transceiver according to claim 29, wherein said dual polarization antenna includes:

a transmission antenna; and

a reception antenna separated by a distance from said transmission antenna.

37. A transceiver according to claim 29, wherein said dual polarization antenna includes:

a single antenna having a dual polarization capability for transmitting information with a first polarization, and for receiving information with a second polarization.

38. - 39. (Canceled)

40. A transceiver according to claim 29, further including:

both said modulator and said demodulator.

41. – 75. (Cancelled)

76. Apparatus according to claim 11, wherein said data input means is configured to receive data modulated on an intermediate frequency of 2-3 GHz.

77. Apparatus according to claim 76, further including:

a local oscillator for modulating said data with a frequency on the order of 18 GHz.

78. Apparatus according to claim 76, wherein said power output means further includes:

plural, parallel amplification channels.

79. Apparatus according to claim 78, wherein said power output means further includes:

at least one coupler for splitting a signal from said data processing means into said plural, parallel amplification channels.

80. Apparatus according to claim 78, wherein said power output means further includes:

at least three couplers for splitting an output from said data processing means into four separate amplification channels, said output from said data processing means being amplified to produce at least about a 0.5 W output in each of said channels.

81. Apparatus according to claim 78, wherein said power output means further includes:

at least one device for combining outputs from each of said plural, parallel amplification channels into a single output channel.

82. Apparatus according to claim 79, wherein said at least one coupler is a 90° hybrid.

83. Apparatus according to claim 79, wherein said power output means further includes:

at least one coupler for combining outputs from said plural, parallel amplification channels into a single output channel.

84. - 85. (Canceled)

86. Apparatus according to claim 11, wherein said performing means further includes:

a demodulating means having a data input means and a data processing means.

87. Apparatus according to claim 11, wherein said performing means further includes:

a demodulating means having a data input means and a data processing means.

88. Apparatus according to claim 87, further including:

a local oscillator for supplying a modulating signal to said modulating means, and for providing a demodulating signal to said demodulating means.

89. Apparatus according to claim 87, further including:

hermetically sealed housings for containing components of a transceiver, components of said modulating means and said demodulating means being mounted directly to said hermitically sealed housings.

90. A method according to claim 25, wherein said step of performing at least one of modulating and demodulating information signals includes:

using an intermediate frequency of 2-3 GHz.

91. A method according to claim 90, wherein said step of performing at least one of modulating and demodulating information signals further includes a step of:

modulating said intermediate frequency using a local oscillator frequency on the order of 18 GHz.

92. A method according to claim 25, wherein said step of performing further includes a step of:

modulating information for transmission as a modulated information signal; and

splitting said modulated information signal into plural, parallel amplification channels.

93. A method according to claim 92, wherein said modulated information signal is split into four separate amplification channels, said modulated information signal being amplified in each of said four separate amplification channels to produce at least about a 0.5 W output in each of said channels.

94. A method according to claim 93, further including a step of:

combining outputs from each of said plural, parallel amplification channels into a single output channel.

95. - 96. (Canceled)

97. A transceiver according to claim 36, wherein said at least one of a modulator and a demodulator further includes:

a local oscillator for modulating an intermediate frequency of 2-3 GHz with a frequency on the order of 18 GHz.

98. A transceiver according to claim 36, wherein said modulator further includes:

plural, parallel amplification channels.

99. A transceiver according to claim 98, further comprising:

at least one coupler for establishing said plural, parallel amplification channels.

100. A transceiver according to claim 98, further comprising:

at least three couplers for establishing said plural, parallel amplification channels, each of said amplification channels producing at least about a 0.5 W output.

101. A transceiver according to claim 99, further comprising:

at least one device for combining outputs of each of said plural, parallel amplification channels into a single output channel.

102. A transceiver according to claim 100, wherein said couplers are 90° hybrids.

103. - 104. (Canceled)

IX. EVIDENCE APPENDIX

NONE

X. RELATED PROCEEDINGS APPENDIX

NONE